The annual amount raised by private munificence for American universities and colleges has in a few years been doubled; and, as recent notes in these columns have shown, there is no sign of any decline in the generosity of the men of wealth in the States. The amount of money raised in this way in the United Kingdom during the period 1871–1901 was only one-eighth of that contributed in the United States in the same time; and if the present scale of American gifts be continued, the comparison at the end of 1931 will be such as to leave us at a still more hopeless disadvantage.

All the statistics here brought together tell the same story; alike as regards number of students, number of university teachers, total value of university property and total annual income, from whatever point of view looked at, there is evidence of a strong and healthy growth in the system of higher education in the United States; and, though it can by no means be suggested that similar work in this country has remained stagnant, the most optimistic student of British affairs will hardly maintain that our universities and colleges can show progress and development at all commensurate with that the report of the Commissioner of Education reveals as true of the United States. It is clear that patriotic men of science among us cannot afford to relax their efforts to increase the efficiency of our universities and colleges, and to supplement their number. Students of science do not need to be reminded of the intimate connection between cause and effect, but it behoves them to take every opportunity to convince statesmen and the public that industrial supremacy is, in the long run, one of the effects of an adequately equipped and generously endowed system of higher education.

A. T. S.

THE ASIATIC SOCIETY OF BENGAL.

THE Asiatic Society of Bengal, since its foundation in 1784 by that pioneer of oriental studies, Sir W. Jones, has played a leading part in the exploration of the natural history, philology, antiquities, and other branches of scientific inquiry connected with the East. Its Journal has been enriched by contributions from many eminent authorities, among whom may be named, in addition to its founder and older scholars such as H. H. Wilson, Prinsep, Sir A. Cunningham, Jerdon, Blyth, and Ball, men like Drs. Hoernle, Grierson and Annandale, Messrs. T. H. Holland and V. A. Smith, who are happily still at work. Like all scientific organisations in the East, it has suffered vicissitudes. The short and broken residence of Europeans in the country, pressure of official work, lack of native co-workers, want of libraries of reference, and last, not least, the indifference of the Indian Government, which prefers that its servants should devote their spare time to the judgments of the High Courts or the circulars of the Board of Revenue rather than to the science and literature of the country, have at times interrupted its progress. But under its present managers it seems to be inspired by a new spirit of enthusiasm. Its membership has increased within the last year by more than 50 per cent.; the Indian Government has at last begun to regard it seriously, and through the Lieutenant-Governor of Bengal, who now acts as president, has suggested a scheme for bringing its work into closer relation with that of European officials.

These gratifying signs of progress are reflected in its new publications. Besides its well-known Journal, it has commenced the issue of a series of monographs prepared by competent writers, well illustrated, and sold to the public at a very moderate price. These memoirs cover a wide range in the fields of natural science, philology, and anthropology. Among the most energetic naturalists is Dr. N. Annandale, the author of "Fasciculi Malayenses" and a study of primitive life in the Hebrides and Orkneys, who has now found a fresh field of activity as curator of the fine Calcutta collections. It is one of the ironies of fate that his name will survive in the scientific literature of the future linked with that of a new species of earwig, *Anisolabis annandalei.* He has recently contributed to the Journal a valuable series of papers on the fresh-water fauna of India, special monographs on Malaysian barnacles and the common Hydra of Bengal, and has opened an almost new field of study in his monograph on the "Fauna of a Desert Tract in South India," Rāmanād, in the Madura district, a region which might naturally, for zoological purposes, be regarded as worked out, but where his trained eye has discovered much new and interesting material.

In anthropology the society is judiciously working in connection with the Ethnographical Survey recently revived and extended by Lord Curzon, and has received from it several valuable communications. Mr. Sherring, who recently published an account of explorations in western Tibet, gives a further account of the Bhotiyas, and Mr. A. H. Francke of the Dards of the same region; the late Father Dehon, S.J., describes the religion of the Uraons of Bengal, and Mr. E. H. C. Walsh discusses the remarkable cup-mark records in the Chumbi Valley. Here, again, Dr. Annandale has made a new departure in the first of a series of notes dealing with the arts, industries, and implements of the more primitive tribes, which describes the blow-gun, which seems to have been imported into southern India by the Malays. Studies such as these will, we trust, lead to the foundation of an Indian Pitt-Rivers museum, the ample materials for which at present in existence will soon disappear unless their collection is taken up in earnest.

In another direction the society has started a valuable work by establishing a medical section, which proposes to organise the workers now engaged in the study of tropical disease. In this connection the monograph by Messrs. Hooper and Mann on earth-eating, already described in NATURE (vol. lxxiv., p. 543, September 27, 1906), is full of interest. This remarkable craze appears to be spreading rapidly among the coolies in tea-gardens in Assam, and the dangers resulting from the practice are attracting serious attention. It is not a racial characteristic, but is found in all parts of the country; it appears to depend on the purely mechanical effect of various kinds of earth in relieving gastric or intestinal irritation. When once indulged in, the craving becomes uncontrollable, and leads to serious disease of the digestive canal.

All classes of students will accept these new publications as a record of excellent scientific work, and will congratulate this historic society on its recent satisfactory progress.

ROBERT WARINGTON, F.R.S.

WE regret to learn of the death of Mr. Robert Warington, F.R.S., at Harpenden on March 20. Mr. Warington was the son of Robert Warington, F.R.S., for a long time chemist for the Society of Apothecaries, and was born in 1838. Being of delicate health, he was educated entirely at home, and learnt his first chemistry from his father. In 1859 he worked for some time as a voluntary assistant in the Rothamsted Laboratory, and in 1862 went to the Royal Agricultural College at Cirencester as assist-

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ant, first to the late Dr. Augustus Voelcker, and then to Prof. A. H. Church. In the next nine years Warington was chemist at Sir John Lawes's tartaric acid works, but in 1876, being desirous of devoting himself entirely to research, he came again to the Rothamsted Laboratory, where he remained until 1890.

Although Warington's chief interest was in agricultural chemistry, he published a number of papers dealing with inorganic chemistry, and a detailed account of the various salts of tartaric and citric acids as they occur in their natural sources and in the manufacture of these substances.

On his return to the Rothamsted Laboratory in 1876, Warington introduced several improved methods of analysis to save time or ensure greater accuracy in the routine determinations; there also he carried out the investigations on nitrification by which he made his name. In 1877 appeared the paper of Schloesing and Müntz which showed that the production of nitrates in the soil must be due to living organisms; this work was repeated by Warington, who continued to investigate the conditions favourable to the process. He showed that light would inhibit the change, and that the drying of the soil was sufficient to destroy the organism; he also investigated the distribution of the organism, and showed that it was confined to the surface layers of ordinary soil, being only present in any quantity in the portion usually stirred by the plough. Observing that the oxidation of the ammonia or urea employed sometimes stopped at the stage of nitrite, he succeeded in demonstrating that the process in ordinary soils takes place in two stages due to different organisms, one oxidising ammonia to nitrous acid, the other completing the oxidation to nitric acid. Warington had actually accomplished the final step in the isolation of the two organisms, though he had not brought his work to the stage which satisfied himself, when his researches were unfortunately interrupted, and before he could resume Winogradsky published his elegant method of isolating the nitrous and nitric organisms by the use of a nutrient silica jelly.

The circumstances which led to Warington thus missing the credit of the crowning point of his long researches on nitrification undoubtedly caused him bitter disappointment; he continued to live in Harpenden, but took no further part in research. In the course of his investigations on nitrification Warington also observed and studied that other process of denitrification, by which previously formed nitrates are reduced again, often with loss of the nitrogen as gas. In later years this subject became very prominent for a time, but the essential conditions of the action had been laid down before in Warington's papers. He also investigated the method of estimating small quantities of nitrates by means of indigo, and devised a standard process which, in a simplified form, is now used by most water analysts.

Warington gave a course of lectures in America for the Lawes Agricultural Trust in 1891; these were afterwards published by the United States Department of Agriculture; he was also Sibthorpian professor of rural economy at Oxford, 1894–7.

His "Chemistry of the Farm" was published in 1881, and has since gone through fifteen editions; though only a small book, it is noteworthy for its lucidity and compactness in the handling of a mass of experimental data: it is a model text-book which has no rival in any language, and on it the present generation of agricultural chemists in this country has been educated.

Warington was elected to the Royal Society in 1886; his connection with the Chemical Society, of which his father was one of the founders, dates back to 1863; he was vice-president from 1889 to 1893, and in its Transactions appeared nearly all his original work.

Warington's scientific work is distinguished by clearness and precision; the range is not wide, but everywhere it shows the minute care and the regard for accuracy with which he worked; in these respects his work only reflected his personal character.

A. D. H.

M. P. E. BERTHELOT.

THE death of M. Berthelot was briefly recorded in the columns of NATURE last week. The writer has been asked, as a former pupil of the great master, to give some account of his life and work.

Marcelin Pierre Eugène Berthelot was born in Paris on October 25, 1827. He was the son of a medical man, Dr. Jacques Martin Berthelot, and was educated at the Lycée Henri IV. In 1846 he obtained the prix d'honneur de philosophie at the concours-général, open to the best students of the highest classes of the lycées of Paris. In February, 1851, he became assistant (préparateur) to Balard, the discoverer of bromine, who held the chair of chemistry at the Collège de France. He kept this minor position until December, 1859, when he was appointed professor of organic chemistry at the École supérieure de Pharmacie. In 1865 a chair of organic chemistry was created for him at the Collège de France, which he held until his death. In 1870–1 he acted as president of the Comité scientifique de défense during the siege of Paris. In 1873 he was elected member of the Academy of Sciences, of which he afterwards became perpetual secretary. In 1876 he was appointed inspector-general of higher education; in 1881, senator for life. He was Minister of Public Instruction from December, 1886, to May, 1887, and Minister of Foreign Affairs in 1895–6. In 1900 he was elected a member of the French Academy.

The French nation has from the time of the Revolution turned more than once to its scientific men for help in the conduct of national affairs. The names of Lavoisier, of Lazare Carnot, mathematician and organiser of victory, of Fourcroy, of Dumas, and of Paul Bert recur to the memory. But if Berthelot took an untiring part in public affairs, and especially, as member of the Conseil supérieur de l'Instruction publique, in educational affairs, it is not as an administrator or as a minister that he will be remembered, but as a chemist, and perhaps the greatest, as he was the most prolific, chemist of his age.

Of his first studies in chemistry I have found no account, but we know that Claude Bernard in 1848 asked him for chemical assistance in his early work on glycogen.

It was in 1850 that he published his first paper, on a method of liquefying gases. Between that date and 1883 the Royal Society's catalogue records against his name the titles of between 600 and 700 papers; it is probable that their total number falls little, if anything, short of a thousand, and to these must be added eighteen or twenty books, some of them, it is true, being only the summaries of published papers, but others, and especially his works on the history of chemistry, in a large measure independent publications. To estimate justly the value and influence of this colossal contribution to science would be the work of months rather than of a few hours, and, indeed, the very mass of the work has perhaps hidden something of its significance and of the importance of the underlying ideas.

Berthelot first gave his measure in his doctoral

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